# 3 Human populations – Part 2

Name: _____ Class: _____ Date: _____

## Vocabulary 词汇

*Write each word three times.* 把每个单词抄写三遍。

| English | 中文 | Write it 3 times (English) |
|---|---|---|
| age-structure diagram | 年龄结构图 | |
| total fertility rate | 总生育率 | |

## Recall

The human population has grown very fast, but not evenly everywhere:

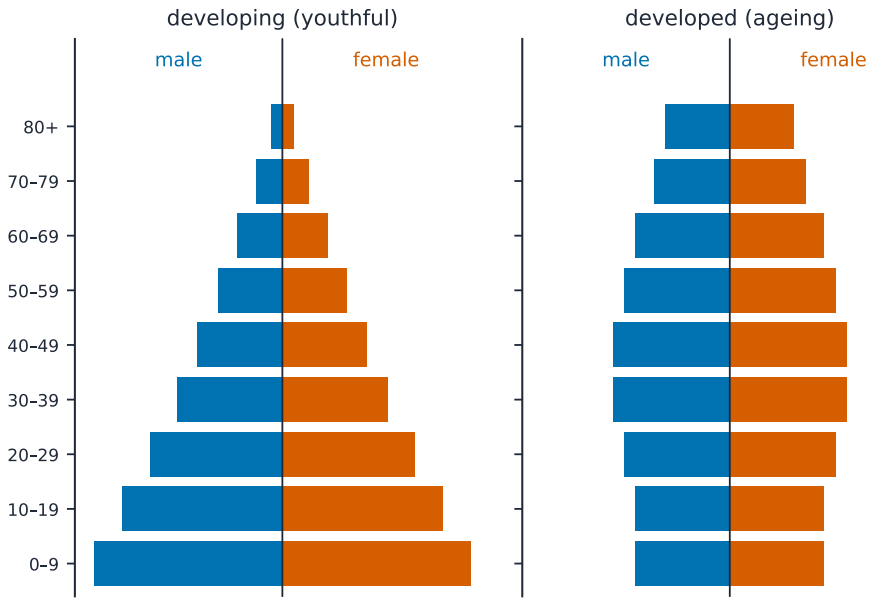
- Some countries have many young people; others have an ageing population.
- Birth rates are higher in some countries than others.

Each idea has a short worked example before the Practice.

## New ideas

### ■ 1 Age-structure diagrams

An **age-structure diagram** 年龄结构图 shows how many people are in each age group. A **wide base** (many children) predicts rapid growth; even bars predict a stable population.




## 2 Total fertility rate

The **total fertility rate** 总生育率 (TFR) is the average number of children per woman. A **replacement level** of about 2.1 keeps a population steady; above it grows, below it shrinks.

## 3 Doubling time (rule of 70)

A population's doubling time is found from the **rule of 70**: divide 70 by the growth rate (as a percent).

*Worked example.* A country grows at 2.0% per year, so it doubles in about $\dfrac{70}{2.0} = 35$ years. At 3.5% it would double in only 20 years.

## 4 The demographic transition

As a country develops, its growth changes in stages: (1) high birth and death rates, (2) death rate falls (fast growth), (3) birth rate falls (slowing), (4) both low (stable).

**Watch out:** a falling **growth rate** does not mean the population is shrinking – it is still growing, just more slowly. The population only shrinks when births fall below deaths.

## Practice

Try these in order. The methods are all above.

**2.1** State what a wide-based age-structure diagram tells you about a population. [1]

**2.2** State the replacement-level total fertility rate and what it means. [2]

**2.3** A population grows at 1.4% per year. Use the rule of 70 to find its doubling time. [2]

**2.4** A population grows at 5.0% per year. Find its doubling time. [2]

**2.5** Name two factors that tend to lower a country's birth rate as it develops. [2]